MW

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/811,081	03/16/2001	Thomas Mossberg	LTSM01NP	6284

23892 7590 12/30/2003

DAVID S ALAVI
3762 WEST 11TH AVENUE
#408
EUGENE, OR 97402

EXAMINER	
AMARI, ALESSANDRO V	

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 12/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/811,081	MOSSBERG, THOMAS	
	Examiner	**Art Unit**	
	Alessandro V. Amari	2872	ML

-- The MAILING DATE of this communication app ars on th cover sheet with the correspond nc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 September 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16,18-54 and 87-136* is/are pending in the application.

4a) Of the above claim(s) *1-11,26-33,36-44 and 56-105* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-16,18-25,34,35,45-54 and 106-136* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. This application contains claims 1-11, 26-33, 36-44 and 56-105 are drawn to an invention nonelected with traverse in Paper No. 9. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 106, 107, 111, 112, 116, 117, 122, 123, 135 and 136 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 106, 107, 111, 112, 116, 117, 122, 123, 135 and 136, the recitation that each portion of the second or output temporal waveform includes contributions from a plurality of portions of the first spatial wavefront or that each portion of the second or output spatial wavefront contributes to a plurality of portions of the second or output temporal waveform has not been described in the specification. As such, this recitation constitutes new matter.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 12-16, 18-25, 34, 35, 45-54, 108-120, 121-136 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regard to claims 12, 34, 45, 121 and 134, the recitation that "propagation through the volume hologram over a distance large enough so that temporal retardation effects within the volume hologram transform the first temporal waveform into the respective output temporal waveforms" is vague and indefinite, especially the phrase, "over a distance large enough". Further, there is no indication in the specification defining the distance and what is considered "large enough". Claims 13-25, 34, 35, 45-53, 106-120, 122-133, 135 and 136 inherit the same issue.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 12-13, 16, 18, 19, 23, 24, 34, 35, 45-54, 106, 107, 111, 112, 116, 117 and 134-136 are rejected under 35 U.S.C. 102(b) as being anticipated by George et al U.S. Patent 4,834,474.

In regard to claims 12, 34, 45 and 134, George et al teaches (see Figures 1b, 2b and 4b) an optical apparatus comprising a volume hologram including a plurality of

diffractive elements (12) exhibiting a positional variation in at least one of amplitude, optical separation, and spatial phase over some portion of the volume of the hologram interacting with an input optical signal having a first spatial wavefront and a first temporal waveform to produce an output optical signal having a second spatial wavefront and a second temporal waveform, wherein the first and second spatial wavefronts differ in at least one of spatial wavefront shape and output direction, and the first temporal waveform differs from the second temporal waveform or a plurality of output optical signals, each output optical signal having a spatial wavefront that differs from the respective spatial wavefronts of all other output optical signals, each output optical signal having a respective temporal waveform, wherein at least two of the output optical signals have temporal waveforms that differ from one another; and a plurality of output ports configured to accept and transmit the plurality of output optical signals, wherein each portion of the first spatial wavefront contributes to each of the output optical signals by scattering from the diffractive elements during propagation through the volume hologram over a distance large enough so that temporal retardation effects within the volume hologram transform the first temporal waveform into the respective output temporal waveforms as described in column 2, lines 47-65 and column 5, lines 22-41.

Regarding claims 13, 35 and 49, George et al teaches that the input optical signal comprises an optical pulse as described in the abstract and column 5, lines 22-41.

Regarding claims 16 and 54, George et al teaches the volume hologram is an optical waveform cross-correlator as described in column 2, lines 47-65 and column 5, lines 22-41.

Regarding claim 18, George et al teaches that each of the diffractive elements has a spherical contour and a center of curvature as shown in Figures 1b, 2b and 4b.

Regarding claim 19, George et al teaches that the centers of curvature of a plurality of the diffractive elements are coincident as shown in Figures 1b, 2b and 4b.

Regarding claim 23, George et al teaches that the propagation direction of the input optical signal is not collinear to the propagation direction of the output optical signal as shown in Figures 1b, 2b and 4b.

Regarding claim 24, George et al teaches all diffractive elements have an elliptical contour, with each diffractive element having a first focus and a second focus, and wherein a plurality of the respective first foci of the diffractive elements coincide, and a plurality of the respective second foci of the diffractive elements coincide as shown in Figures 1b, 2b and 4b.

Regarding claims 46 and 47, George et al teaches that the volume hologram further comprises spatial transformation information and the diffracted optical signal is spatially transformed as described in column 5, lines 22-41.

Regarding claim 48, George et al teaches that the input optical signal has a first direction of propagation and the diffracted optical signal has a second direction of propagation, and where the first direction of propagation is not collinear to the second direction of propagation as shown in Figures 1b, 2b and 4b.

Regarding claims 50, 51, 52 and 53, George et al teaches that the volume hologram further comprises spectral and spatial transformation information and the diffracted optical signal is spectrally and spatially transformed as described in column 7, lines 52-67.

Regarding claims 106, 111, 116 and 135, George et al teaches that each portion of the second or output temporal waveform includes contributions from a plurality of portions of the first spatial wavefront as shown in Figures 1a and 1b and as described in column 5, lines 22-41.

Regarding claims 107, 112, 117 and 136, George et al teaches that each portion of the second or output spatial wavefront includes contributions from a plurality of portions of the second or output temporal waveform as shown in Figures 1a and 1b and as described in column 5, lines 22-41.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 14, 15, 20, 25, 108-110, 113-115, 118-120, and 121-133 are rejected under 35 U.S.C. 103(a) as being unpatentable over George et al U.S. Patent 4,834,474 in view of Weverka U.S.Patent 5,165,104.

Regarding claims 14, 15, 20, 25, 108-110, 113-115 and 118-120, George et al teaches the invention as set forth above, and in regard to claims 20 and 25, George et

al teaches that the respective input and output waveguides are located at respective conjugate image points of the plurality of the diffractive elements whose centers of curvature are coincident as described in column 6, lines 30-55 and column 10, lines 17-27 and as shown in Figure 4b. The conjugate image points are broadly interpreted as being two sources which are equally well imaged at two different points as for example, the points shown in Figure 4b (incident pulse and diffracted pulse). Since the incident pulse and the diffracted pulse are equally well imaged accordingly the two are interpreted as respective conjugate image points.

In regard to claim 121, George et al teaches (see Figures 1b, 2b and 4b) an optical apparatus comprising a volume hologram comprising a plurality of diffractive elements (12) exhibiting a positional variation in at least one of amplitude, optical separation, and spatial phase over some portion of the volume of the hologram interacting with an input optical signal having a first spatial wavefront and a first temporal waveform to produce an output optical signal having a second spatial wavefront and a second temporal waveform, to produce an output optical signal having a second spatial wavefront and a second temporal waveform, the first and second spatial wavefronts differing in at least one of spatial wavefront shape and output direction, the first temporal waveform differing from the second temporal waveform wherein each portion of the first spatial wavefront contributes to each of the output optical signals by scattering from the diffractive elements during propagation through the volume hologram over a distance large enough so that temporal retardation effects within the volume hologram transform the first temporal waveform into the respective

output temporal waveforms as described in column 2, lines 47-65 and column 5, lines 22-41.

Regarding claim 122, George et al teaches that each portion of the second temporal waveform includes contributions from a plurality of portions of the first spatial wavefront as shown in Figures 1a and 1b and as described in column 5, lines 22-41.

Regarding claim 123, George et al teaches that each portion of the second or output spatial wavefront includes contributions from a plurality of portions of the second or output temporal waveform as shown in Figures 1a and 1b and as described in column 5, lines 22-41.

Regarding claim 124, George et al teaches that the input optical signal comprises an optical pulse as described in the abstract and column 5, lines 22-41.

Regarding claim 127, George et al teaches the volume hologram is an optical waveform cross-correlator as described in column 2, lines 47-65 and column 5, lines 22-41.

Regarding claim 128, George et al teaches that each of the diffractive elements has a substantially circular contour and a center of curvature as shown in Figures 1b, 2b and 4b.

Regarding claim 129, George et al teaches that the centers of curvature of a plurality of the diffractive elements are coincident as shown in Figures 1b, 2b and 4b.

Regarding claim 131, George et al teaches that the propagation direction of the input optical signal is not collinear to the propagation direction of the output optical signal as shown in Figures 1b, 2b and 4b.

Regarding claim 132, George et al teaches all diffractive elements have an elliptical contour, with each diffractive element having a first focus and a second focus, and wherein a plurality of the respective first foci of the diffractive elements coincide, and a plurality of the respective second foci of the diffractive elements coincide as shown in Figures 1b, 2b and 4b.

However, in regard to claims 14 and 15, George et al does not teach that the first spatial wavefront originates from and input optical waveguide or that the second spatial wavefront converges to an output optical waveguide or regarding claims 20, 25, 130 and 133, that the input optical signal originates from an input waveguide and wherein the output signal converges to an output waveguide. Further in regard to claims 108-110, 113-115, 118-121 and 125-126, George et al does not teach a volume hologram residing within a planar optical waveguide, the input optical signal interacting with the volume hologram while propagating within the planar waveguide, each of the input port and the plurality of output ports being positioned at the edge of the planar waveguide, the input optical waveguide being a channel waveguide and the output optical waveguide being a channel waveguide.

Regarding claims 14 and 15, Weverka does teach (see Figure 1) that the first spatial wavefront originates from and input optical waveguide (25, 27, 29) or that the second spatial wavefront converges to an output optical waveguide (33, 35, 37).

Regarding claims 20, 25, 130 and 133, Weverka does teach (see Figure 1) that the input optical signal originates from an input waveguide and wherein the output signal converges to an output waveguide as shown in Figure 1.

In regard to claims 108-110, 113-115, 118-121 and 125-126, Weverka does teach (see Figure 1) a volume hologram residing within a planar optical waveguide as described in column 3, lines 48-61, the input optical signal interacting with the volume hologram while propagating within the planar waveguide, each of the input port and the plurality of output ports being positioned at the edge of the planar waveguide, the input optical waveguide being a channel waveguide and the output optical waveguide being a channel waveguide as shown in Figure 1 and as described in column 5, lines 58-68 and column 6, lines 1-10.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the planar waveguide form factor as taught by Weverka for the optical apparatus of George et al in order to produce a modular apparatus which can be networked and reduces optical losses so as to provide for an improved optical interconnection.

10. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over George et al U.S. Patent 4,834,474 in view of Weverka U.S.Patent 5,165,104.

Regarding claims 21 and 22, George et al teaches the invention as set forth above but does not teach that the first spatial wavefront originates from an input optical waveguide and the second spatial wavefront converges to an output optical waveguide.

Regarding claims 21 and 22, Weverka does teach (see Figure 1) that the first spatial wavefront originates from an input optical waveguide (25, 27, 29) and the second spatial wavefront converges to an output optical waveguide (33, 35, 37).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the planar waveguide form factor as taught by Weverka for the optical apparatus of George et al in order to produce a modular apparatus which can be networked and reduces optical losses so as to provide for an improved optical interconnection.

Furthermore, regarding claims 21 and 22, George et al also does not teach that the input waveguide is separated from the output waveguide by a distance equal to or less than about 5000 microns or that the input waveguide is separated from the output waveguide by a distance between about 5000 microns and about 25 microns.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to separate the input and output waveguides by the micron ranges claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to fix the separation distances for the purpose of focusing the input and output waveforms on the waveguides. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235.

Response to Arguments

11. Applicant's arguments filed 16 September 2003 have been fully considered but they are not persuasive.

In regard to the 35 USC 112 1st paragraph rejection for claims 106, 107, 111, 112, 116, 117, 122, 123, 135 and 136, the applicant has added amended paragraphs to the specification in order to provide a description of the limitations added to the claims.

The Applicant then argues that the added material in the amended paragraphs of the specification merely recite inherent properties and operation of embodiments as originally described in the specification and as shown in Figs 8, 9A, 9B and 12.

In response to this argument, the Examiner has maintained the 35 USC 112 1st paragraph rejection since the applicant cannot add new matter to the original disclosure. Further, it is unclear how Figures 8, 9A, 9B and 12 show explicitly that each portion of the second or output temporal waveforms includes contributions from a plurality of portions of the first spatial wavefront, or that each portion of the second or output spatial, wavefront contributes to a plurality of portions of the second or output temporal waveform. The cited figures merely show the holographic spectral filtering device operating as a multiplexer, demultiplexer or as a cross-correlator and the original disclosure makes no mention of contributions from portions of the wavefronts nor is this an inherent or implicit teaching.

The Applicant further argues that the volume hologram of the prior art, George et al does not meet the definition for term as defined by the Applicant in his specification. Applicant has defined that term "volume hologram" wherein each portion of the wavefront of the input signal contributes to the output signal by scattering from the diffractive structure as it propagates through the structure over a distance large enough so that retardation effects within the diffractive structure significantly influence the form of the output signal. The Applicant maintains that George does not meet this definition in that retardation effects within the diffractive structure have no influence on the temporal form of the output signal and that the temporal form of the output signal arises

from position and/or wavelength dependent differences in propagation distance outside the diffractive structure.

In response to this argument, while the inventor may define specific terms used to describe invention, he or she must do so "with reasonable clarity, deliberateness, and precision" and, if done, must "set out his uncommon definition in some manner within the patent disclosure so as to give one of ordinary skill in the art notice of the change in meaning" (quoting Intellicall, Inc. v. Phonometrics, Inc., 952 F.2d 1384, 1387-88, 21 USPQ2d 1383, 1386 (Fed. Cir. 1992). Any special meaning assigned to a term "must be sufficiently clear in the specification that any departure from common usage would be so understood by a person of experience in the field of the invention." Multiform Desiccants Inc. v. Medzam Ltd., 133 F.3d 1473, 1477, 45 USPQ2d 1429, 1432 (Fed. Cir. 1998). In regard to the term "volume hologram", the inventor has defined volume hologram as being scattered from diffractive elements during propagation over a distance large enough to effect temporal retardation effects within the volume hologram. The Examiner has invoked a 35 USC 112 rejection because the applicant does not define the term "over a distance large enough". Since this is not defined, George using the broadest reasonable interpretation is taken to read on the volume hologram as claimed. Furthermore, the Examiner again directs the Applicant's attention to column 5, lines 36-39 in George et al which states:

> "curves introduced into the holographic element **12** are mapped into spatially varying temporal delays in the diffracted pulse"

and column 7, lines 56-61 in George et al which states:

> "Again *element curvatures are used to impart* programmable spatially-varying temporal delays in the incident pulse. A feature of this delay line is the variability in spectral and angular bandwidth which may be *imparted by the fringe pattern of the volume holographic element structure*" (italics Examiner)

From these two passages, it is clear that the diffractive structure of George et al has retardation effects **within the structure** (i.e., element curvatures and fringe patterns) which influence the form of the output signal and so meet the definition set forth in the specification. This feature is further described in George et al in column 3, lines 1-29 which describes a wavefront of an input signal which propagates through a volume containing interference fringes and which imparts any desired space-time characteristic to an output signal.

The Applicant further argues that George does not disclose anything that may be construed as an optical waveform cross correlator in that a cross correlation is defined as a temporal integral of the product of two time shifted input fields whereas George has an interference pattern defined as the result of a coherent linear superposition of two input fields.

In response to this argument, the Examiner maintains that the volume hologram of George being a holographic reflector/processor would inherently act as an optical waveform cross correlator in that the spatial structure of the diffractive elements of George imparts a specific transfer function which may be broadly construed as meeting the definition of a optical waveform cross correlator. Further, the Examiner would like to

note that nowhere in the original disclosure does the applicant define cross correlation as a temporal integral of the product of two time shifted input fields.

The applicant argues that the prior art, George is silent as to the shape of the diffractive element contours, other than to disclose sets of parallel straight lines and further that George does not disclose that the contours that are circular, elliptical, concentric or confocal.

In response to this argument, the Examiner directs the Applicant's attention to column 5, lines 36-39 in George et al which states:

> "curves introduced into the holographic element **12** are mapped into spatially varying temporal delays in the diffracted pulse";

and column 7, lines 56-61 in George et al which states:

> "Again *element curvatures are used to impart* programmable spatially-varying temporal delays in the incident pulse.

and further in column 3, lines 26-29

> "By varying the shape of the volume holographic gratings, nearly any desired space-time characteristics may be obtained" (italics Examiner)

So, contrary to the applicant's assertion, George et al does teach the shape of the diffractive element contours can be varied and are not simply sets of parallel straight lines.

The Applicant further argues that George does not teach that each portion of the output temporal waveform includes contributions from a plurality of portions of the first spatial wavefront or that each portion of the output spatial wavefront contributes to a

plurality of portions of the second temporal waveform. Further, the applicant maintains that these limitations are inherent in the original disclosure (now explicitly disclosed in the specification as amended) and that the George apparatus depends on wavefront division whereas the applicant's invention does not rely on wavefront division.

In response to this argument, the Examiner has maintained the 35 USC 112 1st paragraph rejection since the applicant cannot add new matter to the original disclosure. Further, it is unclear how the applicant's Figures 8, 9A, 9B and 12 show explicitly that each portion of the second or output temporal waveforms includes contributions from a plurality of portions of the first spatial wavefront, or that each portion of the second or output spatial, wavefront contributes to a plurality of portions of the second or output temporal waveform. The cited figures merely show the holographic spectral filtering device operating as a multiplexer, demultiplexer or as a cross-correlator and the original disclosure makes no mention of contributions from portions of the wavefronts nor is it explained how this an inherent or implicit teaching of the invention.

The Applicant further argues in regard to the 103 rejection for claims 14-15, 20, 25 and 106-133, that there can be no motivation to combine the teachings of George and Weverka since the essence of George is precise control over the output temporal waveform through alteration of the shape of the holographic grating whereas the acousto-optically generated Bragg diffraction gratings of Weverka are used to redirect optical signals within a planar waveguide. The Applicant maintains that the precise shape of the acousto-optically generated grating within the waveguide cannot be controlled with precision and therefore the acousto-optically generated Bragg grating

cannot be incorporated into the device of George to achieve control over the output temporal waveform.

In response to this argument, the applicant is reminded that the rejection is based upon George in view of Weverka and separately attacking the references is not appropriate. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The test for obviousness is not whether the acousto-optically generated Bragg grating cannot be incorporated into the device of George but what the combination teaches. The primary reference, George teaches all of the limitations claimed except for the input and optical waveguides, the volume hologram residing within a planar optical waveguide, the input optical signal interacting with the volume hologram while propagating within the planar waveguide, each of the input port and the plurality of output ports being positioned at the edge of the planar waveguide, the input optical waveguide being a channel waveguide and the output optical waveguide being a channel waveguide. The secondary reference, Weverka provides these features with the motivation to produce a modular apparatus which can be networked and reduces optical losses so as to provide for an improved optical interconnection.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (703) 306-0533. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (703) 305-0024. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

DREW DUNN
SUPERVISORY PATENT EXAMINER

ava ava
24 December 2003